Geology meets Archaeology: Rediscovering the life and work of Geoffroy d'Ault du Mesnil (1842-1921)

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Abstract

The period between the middle of the nineteenth century and the beginning of the twentieth century saw the birth and consolidation of prehistory and archaeology as scientific disciplines. Discussions of method and theory were posed; the antiquity of humankind was demonstrated; stratigraphic and chrono-typological sequences were settled. This process was initially linked to the natural and geological sciences. In France the names of J. Boucher de Perthes, E. Lartet, A. de Lapparent, E. Piette, E. Cartailhac, G. de Mortillet, L. Capitan and H. Breuil appeared; their role in the development of research frameworks at the national, European and international scales is well known, and they have been the subject of detailed studies in the historiography of geology and/or archaeology. However, the name of one of the most influential characters of the period seems to have been forgotten. This paper attempts to reassess the scientific standing and explore the personal life of Geoffroy d'Ault du Mesnil (1842-1921) through first-hand analysis of a variety of sources. The paper analyses the origins of his interdisciplinary approach to science, how he came to be a leading expert on the Quaternary terraces of the valley of the Somme and his key role in research on, and the preservation of, France's prehistoric heritage. This ultimately permits a renewed understanding of d'Ault du Mesnil's contribution to the scientific development of geology and prehistory, in addition to demonstrating how the wider social, economic and political context of the time shaped his own scientific personality.

Key words: History of Geology; History of Archaeology; Quaternary; Palaeolithic; Neolithic; France

1. Introduction

In 2007, within the framework of the ICARE project in France, the digitization, study and promotion of the documentary collection of the *Laboratoire Archéosciences* (formerly the *Laboratoire d'Anthropologie*, Université de Rennes1) was initiated (Daire and López-Romero 2011; López-Romero and Daire 2013). This collection includes a series of documents that stand out from the rest not only due to their number but also their nature. These include part of the scientific archives of Geoffroy d'Ault du Mesnil (1842-1921), a geologist and prehistorian who continued the work of Jacques Boucher de Perthes (1788-1868) in the valley of the Somme and was an influential figure in the career of Henri Breuil (1877-1961).

Although P.-R. Giot wrote a brief profile of d'Ault du Mesnil which took into account some documents preserved in Rennes (Giot 1993), re-analysis of these same documents provides a renewed understanding of this influential figure (López-Romero and Le Gall 2008; López-Romero and Daire op. cit.). The importance of this reappraisal becomes clear when we take into account the fact that d'Ault du Mesnil's name occupies an extremely marginal place in the history of the geology and archaeology of Europe. Indeed, from the second half of the twentieth century, mentions of d'Ault du Mesnil are often either inexact or absent. Many errors regarding his life and work have been repeated over time and references to him, almost exclusively, either highlight his role in the initial education of the young Henri Breuil or some aspects of his research in the valley of the Somme. In spite of all this, as we shall see, the role of d'Ault du Mesnil in the scientific life of the age, and especially in the fields of geology, Palaeolithic and Neolithic archaeology, was extremely significant.

The lack of information about this researcher continues to surprise contemporary authors (Browman 2002: 203). How can this situation be explained? Besides the fact that previous studies of the history of archaeology have afforded some pre-eminence to a nucleus of great figures of prehistory – Boucher de Perthes, G. de Mortillet, Cartailhac, Breuil etc.– one fundamental aspect lies in d'Ault du Mesnil's own reluctance to publish the results of his research. Many of his contemporaries criticised this facet of d'Ault. On the contrary, various allusions to his work (which is always praised for its precision and meticulousness) indicate great respect from contemporaries and the present-day study of his documents attests to a remarkable capacity for work and organisation. No doubt aware of this defect, his colleagues and collaborators occasionally published information relating to his research using his notes. This was the case with some studies presented by Louis Capitan (1854-1929) and Henri Breuil. The destruction, in 1918, of a large part of his personal paleontological collection did not improve the situation. In the absence of a correctly structured corpus of scientific work, following the death of his most direct collaborators, the memory of d'Ault du Mesnil steadily faded.

In this context we have carried out thorough documentary, bibliographical and genealogical research, utilizing the collections available in various institutions and archives. This research gives an account of the scientific work of d'Ault du Mesnil and represents the first dedicated project ever carried out to investigate this significant character. Ultimately, this allows not only an understanding of d'Ault du Mesnil's contribution to the scientific development of geology and prehistory, but also provides

new insights into how the social, economic and political context of the day shaped his scientific career.

2. The origins: 1842-1874

2.1. The family context: power and ideology in nineteenth century France

Charles-*Geoffroy*-Marie-Félix d'Ault du Mesnil[1] was born in Loiré (district of Segré, Angers, Maine-et-Loire; Figure 1) on 17 October 1842. His father's side of the family came from the town of Oisemont (Somme) and his grandfather, César Edouard de Louvel, had been a Knight of the Royal and Military Order of Saint Louis and a former member of the King's Garde du Corps. The family name was changed to d'Ault-Dumesnil (the maiden surname of César's mother) when Louis Louvel, a Bonapartist worker, killed the Duke of Berry, a nephew of King Louis XVIII (Chateubriand, 1861: 558-581). The father of Geoffroy d'Ault du Mesnil has sometimes wrongly been listed as Georges Édouard, the eldest son of César Edouard, due to his notoriety as a soldier and a writer (Brodrick 1963: 27). All we know about d'Ault du Mesnil's actual father, Charles, is that he was a member of the King's Garde du Corps in the company of Gramont installed in the town of Saint-Germain-en-Laye. He married Eulalie Ernestine de Grimaudet de Rochebouët in Paris on 28 October 1836. Her family belonged to a noble lineage too, and d'Ault du Mesnil's maternal uncle (Gaëtan de Grimaudet de Rochebouët) was an influential soldier and politician (Démier 2000: 318-322).

The social and economic status of the family was thus a highly privileged one. In his short biography of d'Ault, Raymond de Passillé (1873-1942) highlights two significant points: that d'Ault was not particularly interested in managing his finances and although his scientific interests were sustained by his family's wealth, their origins cannot be found within the family context (Passillé 1922: 358-360). While there is a lack of concrete evidence, the scientific and literary interests of Georges Édouard may have had some influence in encouraging the scientific curiosity of his nephew. The main reasons behind his scientific career path however, are to be found some distance from Paris.

2.2. Regional research, learned societies and the scientific awakening of Geoffroy d'Ault du Mesnil

Initially, the young d'Ault du Mesnil's training took two forms: individual tutoring, and collaborative training at the heart of a learned society.

Following the death of his wife, Charles left Paris and moved to Vannes (Morbihan, Brittany) with his two sons, Ernest and Geoffroy. This change would have a profound effect on d'Ault du Mesnil's upbringing. They moved into a small house next to a hotel bought in 1820 by the De Limur family. Michel-Louis-François de Limur (1817-1901) was a well-known mineralogist who occupied various positions of political responsibility throughout his life. His collections, displayed in his hotel, were internationally famous, and several British collectors such as John Lubbock (1834-1913) acquired material from them (Owen 2000: 266). During this period, Geoffroy studied at the Jesuit school in Vannes and at the Eudist school in Redon (Ille-et-Vilaine, Brittany) but spent a considerable part of his free time with Limur, who encouraged his

[1] In the civil records his last name appears as d'Ault-Dumesnil. However, we have decided to keep to the format of d'Ault du Mesnil, which is how he recorded it in his publications and personal writings.

early studies in mineralogy and in the petrographic analysis of thin sections (Passillé 1922: 359). Limur had become a member of the *Société Polymathique du Morbihan* in 1838. This society, founded on 29 May 1826 with its headquarters in Vannes, aimed to be a meeting point and research hub for all sciences. Learned societies such as this certainly played a key role in the development and diffusion of science. Focused on one specific subject or on a wide variety of themes, these societies championed the research, publication and conservation of natural, historical, artistic, archaeological, ethnographic or literary heritage. This was especially important in the first-half of the century, when centralised mechanisms for heritage management were not fully established in the country.

At the end of 1863, at the age of only 21, Geoffroy d'Ault du Mesnil entered the *Société Polymathique*, becoming one of its youngest members. His membership coincided with a great expansion in knowledge of Brittany's prehistory, with key research undertaken on megalithic sites of paramount importance (such as Mané Lud, Saint-Michel tumulus, Mané er Hroëk and Gavrinis, in the Morbihan region). D'Ault was associated with the curation of the Musée d'Histoire Naturelle, under the supervision of Armand Taslé (1801-1876). His abilities regarding the study of minerals, acquired with the Count de Limur, were surely already significant and in 1864 d'Ault completed the classification of the museum's two mineralogy collections (the General collection and the Morbihan collection). At the same time, he helped to expand the Morbihan collection by providing samples that he had collected himself (Taslé, 1864, 1867; Capitan 1921: 65; Passillé 1922: 361-362). Shortly after, in 1865, d'Ault du Mesnil was officially appointed assistant curator of the museum, and began organising and adding to the geological collections of Morbihan.

The proximity of the *Musée Archéologique* and the interdisciplinary dimension of the society inspired d'Ault, leading him to become progressively more interested in subjects related to prehistory. He therefore collaborated on the organisation of the archaeological collections which were under the supervision of Léon Davy de Cussé. This collaboration between the two museums opened up new perspectives for him. In 1865 he came into contact with the geologist A. Damour (1808-1902) regarding the raw materials of some objects found during the course of the society's excavations at the monuments of Mané-er-Hroek (Locmariaquer) and Tumiac (Arzon). Damour's analyses (d'Ault du Mesnil 1865) are some of the first dealing with the characterisation and sourcing of raw materials from the Neolithic. It was thanks to this collaboration with the museums of the *Société Polymathique du Morbihan* and other institutions that Damour made a first analytical corpus and published several articles on the subject during the mid-1860s (Damour 1864, 1865, 1866).

During these years, d'Ault began his personal research on the region. In 1866, he published the *Traité des minéraux du département du Morbihan* in a series of catalogues of the natural history of Morbihan, edited by the *Société Polymathique* (d'Ault du Mesnil 1866a). This work, which d'Ault finished writing in May 1865, is essentially descriptive and reflects his work with the Count de Limur analysing his mineralogical collections. Although the author announced the publication of a second part dedicated to the study of the region's rocks, this never seems to have materialised.

Subsequently, his first independent piece of research is to be found in an area somewhere between geology and archaeology. Previously, two competing theories

existed to explain the presence of isolated blocks in the landscape. For some, the blocks had been randomly transported by masses of ice in a distant age. Others favoured the explanation that the blocks had been subject to processes which had altered the rocky substrate to which they originally belonged. The debate reached to the very heart of the *Société Géologique de France* and arguments for and against both points of view accumulated. At that time, one of the defenders of the theory of glacial transportation was Gabriel de Mortillet (1821-1898), who published various notes on the subject (e.g. Mortillet 1866). Basing his arguments on field analysis of the stones used in the monuments of the region of Carnac and Locmariaquer, d'Ault du Mesnil (1866b, 1868) came out in favour of the local sourcing of the majority of the materials. In arguing against the explanation that the blocks were transported by ice, but at the same time criticising the theory that they were transported over large distances by prehistoric societies, d'Ault demonstrated the phenomena of alteration and weathering on granite. In doing so, he put forward the theory that the raw materials used in the monuments had generally been taken from the surrounding areas of the construction site, with the natural fractures of the rock enabling its extraction without the need for quarrying, arguing that the loose stones ('*pierres branlantes*') were simply the result of natural processes on the landscape (d'Ault du Mesnil 1866b: 105-106)[2]. He did, however, identify one exception to the local origin of the rocks: that of some of the slabs used in some monuments of the Locmariaquer region (d'Ault du Mesnil 1866b: 102). The origin of the rock in question (orthogneiss) is well-known today (Querré et al. 2006), as is the extent of its use in the construction of the monuments of the region (e.g. Bonniol and Cassen 2009). In this 1866 study, he also succeeded in showing the different rates of weathering: longer term processes which account for the shaping of rounded landscapes in granitic regions, and shorter term forces which cause decomposition of tiny fragments which disintegrate on a daily basis (d'Ault du Mesnil 1866b: 105; Sellier 1991, 1995; Mens 2008). This short paper had a significant impact when it was first published, as much for its research methodology as for the scope of its conclusions, which had implications for geology, geomorphology and archaeology.

Clearly, the activity of the *Société Polymathique*'s museums at this time was quite intense. As a consequence of his activity in the Musée d'Histoire Naturelle and his collaboration with the Musée Archéologique de la Société, in 1867 d'Ault published the "*Description des objets de l'âge de la Pierre polie contenus dans le Musée archéologique de la Société polymathique du Morbihan (à Vannes)*" along with Léon Davy de Cussé and L. Galles (1827-1874). This volume (Davy de Cussé et al. 1867) constituted the first catalogue of the archaeological collections of the society.

The discoveries made in the region began to increase. In the same year, the objects found in the society's excavations in Mané-er-Hroek (Locmariaquer) were sent to be displayed in the *Exposition Universelle* in Paris (Mortillet 1867: 49-50). Given that the law regulating public establishments prohibited the loan of all objects belonging to museums and state collections, the participation of municipal museums and private collections was essential to the success of the event (Dentu and Petit 1867: 122). The exhibition, the fourth of its kind following those in London (in 1851 and 1862) and Paris (1855), was a showcase for the new industrial and technological developments of the age (Vasseur 2001).

[2] This argument was opposed to some of the classic Celtic theories on the megalithic monuments, and contributed to a more analytical view of them.

The exchanges which d'Ault du Mesnil carried out from his post as assistant curator of the *Musée d'Histoire Naturelle* of the *Société Polymathique du Morbihan*, the experience which he gained from this work and the publication of his first studies were enormously positive for the young researcher. On 4 February 1867, he was admitted as a member of the *Société Géologique de France* after being sponsored by A. Damour and E. de Labadye. It was around this time that he took part in improving the geological map of France, a project which was being promoted by L. Élie de Beaumont (1798-1874), thus establishing relationships with some of the most eminent geologists in France, such as N. de Mercey and, above all, A. de Lapparent (1839-1908). These events mark his integration into a national, widespread scientific community, at a time when there was increasing disagreement between the regional and centralised (Parisian) ways of conducting research.

The activity of the young researcher between 1870 and 1875 is difficult to trace. According to the biographical note written by Raymond de Passillé (1922: 361), following the death of his father – in Vannes on 19 April 1870 – d'Ault du Mesnil began travelling around Europe gathering geological and mineralogical samples. The portrait kept in the *Musée d'Archéologie Nationale* in Saint-Germain-en-Laye (archive no. Doc.phot.2005.111), taken by a photographic laboratory based in Russia, is possibly the only piece of material evidence from this period. D'Ault du Mesnil was called up to serve during the Paris Commune (e.g. Marx 1871) under the orders of General Ernest Louis Courtot de Cissey (1810-1882). In 1874, he returned to the hometown of his father, Oisemont, although he still kept a residence in Paris. On 3 February 1874, he married a distant relative Marie-Elisabeth-*Charlotte* de Rambures (1849-?). The couple then went to live in the town of Abbeville (Somme, Picardy), where their only daughter (Marie-Ernestine-*Elisabeth* d'Ault du Mesnil, 1874-1912) was born later that same year.

3. Stratigraphic analysis and Quaternary research in the valley of the Somme: 1875-1898

3.1. The Societé d'Émulation d'Abbeville and the study of the Quaternary

Finding himself a long way from Brittany, d'Ault du Mesnil began his activity in the region of Picardy gradually. He installed his mineralogy and crystallography collections at the home of the Rambures family in Fresnoy-Andainville, close to Oisemont. In addition, at his home in Abbeville, he began a geological and prehistoric collection which informed his regional research. Just as his entrance in the *Société Polymathique du Morbihan* had marked a turning point in his career, d'Ault's admittance, on 17 May 1877, into the *Société d'Émulation d'Abbeville* (founded in 1797) demonstrated his integration into the scientific circle of Abbeville. He filled the vacancy left in the society by the death of Charles-Joseph Buteux (1794-1876), a botanist and geologist who had collaborated with J. Boucher de Perthes (Ledieu 1912).

D'Ault du Mesnil's research initially concerned the field of geology, completing the geological map of the Somme in collaboration with De Mercey, preparing a study of the Cretaceous areas of the region and enhancing a geological map of the surrounding areas of Abbeville (Société d'Émulation d'Abbeville 1881: 17, 47 and 64). These geological studies led him to analyse the complexity of the deposits in the valley's terraces. At a

time when Palaeolithic research still relied on paleontological or technological models of classification (represented respectively in France by the proposals by E. Piette and G. Mortillet; Coye 1997: 135-140), d'Ault made use of an integrated methodological approach in his study of the terraces. This commitment aligned with Boucher de Perthes' idea of an "*archaeogeological*" program in the study of past societies. Boucher de Perthes' theoretical model aimed to establish the basic principles of archaeological stratigraphy which would take into account both the sequence of geological strata and the context and associations of lithic industries. As several authors have stated (e.g. Coye 1997), Boucher de Perthes never implemented this theoretical approach within any of his fieldwork. D'Ault's experience with prehistoric collections in the museums of Vannes and Abbeville (see below) as well as his training as a geologist however, placed him in a good position to put theory into practice.

Studying fauna thus became an important way for d'Ault to investigate the Quaternary occupation of the Somme. Thanks to his collaboration with the palaeontologist Albert Gaudry (1827-1908), d'Ault was able to propose a climatic sequence based on the species he identified. At the Moulin-Quignon site, where Boucher de Perthes had made his first discoveries, he found an archaeological level with bifacial artifacts and ancient fauna in situ. It was mainly this level that would later lead Breuil to characterise the Abbevillien industry, associating it with the first interglacial period (Breuil 1932; Breuil and Kelly 1954: 5; Bourdier 1974). From some time before 1880, d'Ault also worked in the central area of the quarries of Menchecourt (Breuil and Kolowski 1932: 297-299; Aufrère 1936: 148-149), where he distinguished a transitional level between the Mousterian and the Solutrean marked by changes in the fauna and by various particularities of the lithic industry. D'Ault coined the term Menchecourien to define a pre-Solutrean phase on the basis of this level. These studies were published in 1889 as part of the volume edited by the *Société d'Anthropologie* due to its participation in the *Exposition Universelle* of that year in Paris (d'Ault du Mesnil 1889: 145-175). D'Ault's sequence for the region combined geomorphological evidence with technological classification (d'Ault du Mesnil undated: 3) and went as follows: a warm climate (interglacial) was followed by an extremely wet climate of intense (glacial) cold and, finally, a cold dry climate interrupted by a warm period. This last period was identified thanks to the presence of a type of mollusc, *Cyrena fluminalis*.

3.2. The debate of geo-archaeological chrono-cultural systems

As a result of these investigations, d'Ault was actively involved in debates which led to the progressive establishment of chrono-cultural frameworks for prehistoric France and across Europe as a whole.

One of the most relevant and complex of these debates concerned the Acheulean industry. In the north of France this lithic industry had been known since the middle of the century, mainly thanks to the discovery by M.J. Rigollot (1856) of a large number of hand-axes in Saint-Acheul (Amiens, Somme). Subsequent visits and research by Joseph Prestwich (1812-1896), John Evans (1823-1908), Albert Gaudry (1827-1908) and others confirmed the finds were both in situ and authentic (Grayson 1983: 185-195). It was G. de Mortillet who, in 1872, named the first of the four phases of the Palaeolithic after the site of Saint-Acheul (*Époque de Saint-Acheul*). This phase was based on the presence in the middle terrace of the Somme of large lithic instruments, usually of cordate shape, which were worked on both sides (Mortillet 1872).

Years later, G. de Mortillet unified the industries of the Saint-Acheul type with those identified by Ernest D'Acy (1827-1905) in the lower terrace of Chelles (valley of the Marne; d'Acy 1878), grouping them together under the name of Chelléen (Mortillet 1883). This unification sparked debate among specialists and d'Ault du Mesnil reiterated the unique characteristics of the Saint-Acheul-type lithic industry, emphasising an association to loess deposits. In this he counted on the support of L. Capitan and, above all, A. Gaudry and his wife who had excavated at Saint-Acheul in 1859 (Howell 1966). D'Ault proposed inserting the Acheulean period between the Chelléen and Mousterian phases in Mortillet's classification (Figure 2), something that G. de Mortillet eventually accepted (Mortillet 1891: 49). The Acheulean industry was thus reintroduced and recognised within the evolutionary sequence of the Lower Palaeolithic (Déchelette 1908: 83; Breuil and Kelly 1954: 9). The relationship between d'Ault du Mesnil and G. de Mortillet seems to have been bilateral and cordial and there is a record of their direct relationship from at least 1882. Their differences were limited to a strictly scientific level, and in spite of the twenty-year age gap between them they both had similar professional careers and various common interests. Not everybody however, accepted all the arguments for this division. An intense debate on its differentiation from the Chelléen still persisted between Ernest d'Acy and d'Ault du Mesnil. Through his research from 1875 in the valley of the Somme, d'Ault du Mesnil had demonstrated that the presence of different animal species (*Elephas Antiquus* and *Rhinoceros Merckii*, as opposed to *Elephas Primigenius* and *Rhinoceros Tichorinus*) corresponded to two different lithic assemblages (the Chelléen and the Mousterian), with a transitional phase between the two (the Acheulean; v. Figure 2, *caractères industriels*). Capitan and, now, Mortillet provided further arguments in support of d'Ault du Mesnil's conclusions (see discussion in d'Acy 1894: 189-215).
Further research by Victor Commont (1866-1918) in Saint-Acheul clarified the chrono-stratigraphy of the Somme terraces, with the identification of a pre-Chelléen phase, a Chelléen phase and the consolidation of the Acheulean as a distinct phase (e.g. Commont 1908). Before modern research on the palaeoecological and technological contexts was undertaken, the debate on the chrono-stratigraphy of the Lower and Middle Paleolithic continued (Sommé et Tuffreau 1978). As mentioned above, in the 1930s Henri Breuil replaced the Chelléen with the Abbevillien, chiefly relying on the bifacial industries identified by G. d'Ault du Mesnil in the upper terrace in Abbeville.

The whole set of observations made from 1875 by d'Ault constituted the first detailed study of the correlation between the geological strata, fauna and lithic industries of Abbeville. However, the (partial) synthesis of the results was not published until 1896. This delay and reticence in publishing raised severe criticism among some of his contemporaries. Geologist and palaeontologist Marcellin Boule (1861-1942) stated that the publication came too late as the results were already known. Boule even criticised its clarity and pointed out methodological defects, insinuating these were due to weaknesses at the scientific level (Boule 1896: 695). Despite this, Boule did recognise the value of d'Ault's research in the interpretation that although each industry had its own characteristics, in each of the levels the continuity of earlier types could be observed (d'Ault du Mesnil 1896). For many other authors, however, among whom were Thomas Wilson (1832-1902) (Wilson 1899: 589) and G. de Mortillet (Mortillet 1883: 265, 1891: 250), the quality of d'Ault du Mesnil's research on the Quaternary was beyond all doubt and these studies had come to be recognised as pioneering works in their field.

As a direct consequence of his increasing expertise, D'Ault du Mesnil was involved in the debate on the so-called Eolithic industries (the *Éolithique* period, as named by G. de Mortillet) and on the possible existence of 'Tertiary man'. In France this debate focused mainly, from the late 1860s, on the site of Thenay in southern France (Bourgeois 1868). G. de Mortillet had integrated the period into his cultural and morphological evolutionary model, but growing scepticism surrounded the interpretation of the Eolithic industries as human-made products. In order to shed new light on the eolith deposits, the *Association Française pour l'Avancement des Sciences* (AFAS) charged Geoffroy d'Ault du Mesnil and François Daleau (1825-1927) to conduct a series of exploratory excavations on the site of Thenay in 1884. As a result of this work, d'Ault pointed out the impact of post-depositional forces on the level containing the flint and the fact that the absence of paleontological remains did not allow an accurate chronological classification (d'Ault du Mesnil 1885). The exact role of d'Ault du Mesnil within this debate is not clear, with him leaving the study of the flints to a later – never written? – report and the analysis of some of the artifacts to M. Boule and E. Cartailhac (d'Ault du Mesnil 1885: 241). However, he does refer to the presence in Thenay of flint flakes produced 'by natural causes', relating this phenomenon to similar finds in clay deposits in Picardy that were impossible to distinguish from those obtained by intentional knapping, and pointing out that this could be a key issue in the interpretation of the eoliths (op. cit.: 246). The question over whether the origins of eoliths were natural or cultural continued up until the beginning of the twentieth century, when the theory of unilineal evolution was questioned and progressively replaced (Boule 1905; Sommer 2011).

3.3. G. d'Ault du Mesnil and the collections of J. Boucher de Perthes

As a result of his membership of the *Société d'Émulation d'Abbeville*, d'Ault became the administrator of the city's museums (Musée Boucher de Perthes and Musée du Ponthieu) and carried out a thorough reorganisation of both of them (Agache 1971: 271; Aufrère 2007: 38)[3]. The prehistoric and proto-historic ceramics and metals of the region were deposited in the Musée du Ponthieu, founded in 1833 by the Société d'Émulation. The objects made of stone, horn and bone were sent to the Hôtel de Chépy, the home of the Boucher family, which had become, in 1868, the Musée Boucher de Perthes (Figure 3). The reorganisation of the geological and prehistoric collections by d'Ault du Mesnil had two objectives: to update the way in which the objects were displayed in light of his own recent research, and to educate the general public about Abbeville's prehistory and the character of Boucher de Perthes. Until the moment that d'Ault du Mesnil became administrator, the classification and exhibition of the prehistoric collections was based on strictly morphological criteria. As we have seen, d'Ault du Mesnil's work allowed differentiation between the various levels which existed throughout the valley of the Somme and for the establishment of a relative chronology. This allowed a fundamental change, not only in the display of the archaeological object, but also, and more specifically, in the analysis of its context: "*The archaeologist will observe the various phases of lithic industry. The casual visitor will, at least in part, satisfy his legitimate curiosity, learning it was possible to establish a relative chronology of the deposits in Moulin Quignon and Menchecourt, establishing their geological age. By learning this, the public will pay a well-deserved tribute to the illustrious creator of prehistoric*

[3] Part of the Boucher de Perthes's collections had previously been transferred to the *Musée des Antiquités Nationales* in Saint-Germain-en-Laye, near Paris.

archaeology [i.e. J. Boucher de Perthes]" (author's translation from the original in French: d'Ault du Mesnil undated). A second problem concerned the presence of lithic elements of purely natural origin as well as the existence of several forgeries that Boucher de Perthes had acquired over the years without questioning their authenticity (Cartailhac 1889: 19; Déchelette 1908: 7). D'Ault's work in this respect was equally of great importance, identifying among the collections imitations of high quality which even reproduced the whitish patina of the originals (d'Ault du Mesnil 1890; Mercer 1893: 968). In addition to a description of the state of the different rooms and spaces in the Musée Boucher de Perthes following this restructuring (Aufrère 2007: 38 and 89), we found a group of images which attest to the results of the work carried out by d'Ault du Mesnil (Figure 4).

4. Encounters, diversification and consolidation

The activities carried out by d'Ault du Mesnil in the Quaternary terraces and the scientific framework which he applied to the museums began to receive attention. We have already referred to the implications his interpretations had on some of the most important debates of the age. What influence though, did d'Ault's research have on other researchers during these final decades of the century?

The best known of these influences was on Henri Breuil. During the 1880s and 1890s d'Ault spent his time between Abbeville and the countryside, making frequent journeys between the two. It was in this context, as a result of family relationships, that he met Henri Breuil at the home of Paul de Boiville in Bouillancourt (Breuil undated a; Breuil 1921, 1936; Heleno 1956; Vaufrey 1962; Brodrick 1963; Ripoll Perelló 1994; Hurel 2011). Without wishing here to go into the well-publicised role d'Ault played introducing the young Breuil to the scientific circles of the age – in relation to Édouard Piette (1827-1906), L. Capitan, etc. – it is necessary to highlight the direct and active presence of d'Ault du Mesnil in key episodes of Breuil's early scientific work. It is known that between 1896 and 1898 they visited the archaeological sites of Saint-Acheul, Montières and Étouvie (Amiens, Somme) and Chelles (Seine-et-Marne) as well as the Musée de Soissons (Aisne) together. In August 1896 d'Ault showed Breuil his personal collections at his home in Abbeville, which made a great impression on the latter (Breuil 1936: 56-57). In 1881, a brief description of the state of this collection was also registered in the sessions of the Société d'Émulation d'Abbeville (1881: 55). Those descriptions – along with one image (Figure 5) recently rediscovered in the course of this research – are important sources of evidence as d'Ault's home in Abbeville was destroyed by bombing raids in 1918.

Breuil also participated in the excavations in Campigny during the summers of 1896 and 1898 (see below) and the influence and reputation of d'Ault became essential in promoting his first scientific studies. He was encouraged by d'Ault to begin research on the Bronze Age, which, along with other subjects, he presented for the first time at the 28th congress of the *Association Française pour l'Avancement des Sciences* (AFAS), held in Boulogne-sur-Mer in 1899. The AFAS congress subsequently gave Breuil the opportunity to visit the British Museum with d'Ault du Mesnil and Capitan (Figure 6; Breuil undated b) and to see the private collections of John Evans (1823-1908), president of the Geological Society of London (1874–1876), president of the Society of Antiquaries (1885 to 1892) and Fellow of the Royal Society (from 1864). These collections were interesting for many reasons as Evans owned a lot of material from the Somme, as well as having been in contact with Boucher de Perthes and having travelled

on several occasions to the quarries of Abbeville and Amiens (Evans 1897; Macgregor 2009).

Other encounters are much less well known. In addition to his research on the Quaternary and the Palaeolithic, d'Ault had also shown interest in the upper levels of the terraces of the Somme, which largely corresponded to Neolithic period occupation. This interest led him to work at new sites. From 17-20 August 1890 he worked with L. Capitan at the site of the stilt houses (*palafittes*) on Lake Clairvaux in the Jura region (d'Ault du Mesnil and Capitan 1899). Between 1896 and 1898, he excavated at the archaeological site of Campigny (Blagny-sur-Bresle, Seine-Maritime) in the company of L. Capitan and P. Salmon. The study of this site (Figure 7) had, since 1886, permitted the characterisation of one of the phases of the French Neolithic period (Salmon 1886; Salmon et al. 1898), something which would not be accepted by all experts and would again be a subject of debate. The critics argued that although the data supporting the study had been obtained through a robust methodology, the interpretation of the evidence had been taken too far (A. de Mortillet 1899; Boule 1900: 72). During his time working in Campigny, d'Ault du Mesnil made frequent visits to the De Morgan family. D'Ault had come to play an important role in the professional career of Jacques de Morgan (1857-1924), the orientalist and future Director General of Egyptian Antiquities. He and G. de Mortillet had assisted the development of his research career by introducing Jacques to the scientific circles of the time (Jaunay 1997: 97 and 255).
One of the least known encounters, however, and one that may prove to be of paramount importance to understanding d'Ault's impact upon research, concerns the American archaeologist Henry Chapman Mercer (1856-1930). During his journey around Europe, Mercer visited d'Ault in November 1892 and analysed the terraces of the Somme, comparing them with findings from Trenton in North America (Mercer 1893; Christenson 2011). During this visit, d'Ault acted as a guide showing Mercer the Quaternary terraces, the Musée Boucher de Perthes and his personal private collections in Abbeville. D.L. Browman (2002) has reflected on the influence that d'Ault du Mesnil may have had on Mercer – and subsequently in the next generation of American archaeologists – especially in the promotion of the stratigraphic method. He concludes that it is in other French researchers like de Mortillet and Gaudry that such influence is more likely to be found (Browman 2002: 203 and 207).
G. de Mortillet's experience in the application of the stratigraphic method however, was limited compared to researchers such as Piette and d'Ault du Mesnil. In light of our current research we believe that the influential role of d'Ault was crucial, but further analysis is necessary to confirm this point beyond doubt.

The end of the nineteenth century witnessed widespread recognition of d'Ault du Mesnil's scientific talents. As a result of his research activities and career since the 1860s, he was named *Officier d'Académie* (1889) and *Officier de l'Instruction Publique* (before 1899). On the occasion of the annual congress of the French Archaeological Society in Abbeville (27 June - 4 July 1893), he was also decorated with the highest distinction awarded by the society (*grande médaille de vermeil*), for his geological studies and for his excavations in different locations all over the country. These distinctions signified his successful integration at a national level into the world of French scientific research.

5. Back to the origins: 1898-1921

5.1. The Sub-Commission of Megalithic Monuments (c.1898-1914)

The year 1898 represents a turning point in the scientific career of d'Ault du Mesnil. At this time he was appointed vice president of the *Association pour l'Enseignement des Sciences Anthropologiques* and curator of the collections of the *École d'Anthropologie de Paris*, a leading institution on French prehistory and anthropology. D'Ault would later occupy several positions within the *École d'Anthropologie*, including its presidency in 1903.

However, the positions that would define this stage of his career were the vice-presidency (1898) and presidency (1900) of the *Sous-commission des Monuments Mégalithiques*, which he occupied at the *Ministère de l'Instruction Publique et des Beaux-Arts*. These positions established him as one of the main players in French prehistoric research. The sub-committee depended on the *Commission des Monuments Historiques*, created in 1837, to inventory and preserve the built heritage of the country, and played an active role in the national and international promotion of French research.

From the early 1890s d'Ault du Mesnil had again taken up the study of French megaliths, with a series of works in 1896, 1897 and 1898 that led him to visit different parts of the country (regions of Aveyron, Haute -Loire, Drôme, Indre, Creuse, Finistère ...). His new responsibilities as head of the sub-committee from 1900 allowed him to fully develop this avenue of research, bringing him back to what had been one of his interests at the start of his career.

The role of d'Ault du Mesnil in the recording, research and restoration of the megaliths of the Carnac-Locmariaquer region in southern Brittany has been extremely underappreciated. Beyond the administrative responsibilities he performed from the headquarters of the sub-committee in the Ministry, d'Ault developed an extensive fieldwork program. In this he relied on the participation of local archaeologist Zacharie Le Rouzic (1864–1939). D'Ault's role has systematically been ignored by historiography and, without denying the essential contribution by Le Rouzic before and after d'Ault's presidency of the committee, he was especially active between 1900 and 1914. His presence in the area was so familiar that he became known by the locals as "the father of the dolmens" (Passillé 1921).

One of the most typical examples of his work on the monuments of the Carnac region is the excavation of the Saint-Michel tumulus. Initially excavated by R. Galles and M. Lefebvre in 1862 and 1864 (Galles 1865), new excavations began on 12 June 1900 under the scientific direction of d'Ault du Mesnil (Le Rouzic 1933: 250). Other major projects were carried out under the direction and supervision of d'Ault; including monuments such as Le Manio, Le Rocher's gallery grave (Plougoumelen) or l'Ile Longue. Unfortunately, the publication of a monograph on the megaliths of the region, long planned by him, was never accomplished.

While we do not know if d'Ault du Mesnil's interest in photography predates this stage in his career, it is clear that during this time it became a fundamental tool in his work. For example, he took pictures of the same monuments in subsequent years, using different photographic cameras and experimenting with different types of exposure and photographic paper.

Despite the priority given to the study of the megalithic monuments during this period, d'Ault du Mesnil's research also included other subjects. Either on his own initiative or on the request of the *Sous-commission des Monuments Mégalithiques*, d'Ault du Mesnil carried out observations into the geology and paleogeography of the Breton coasts (i.e. Quiberon Peninsula; Hervé 1903: 434-435), publishing short ethnographic notes,

undertaking (1907 to 1911) a photographic inventory of churches and chapels in different regions, and continuing to work on Quaternary stratigraphy in collaboration with Louis Capitan (Capitan and d'Ault du Mesnil 1900).

The onset of World War I in 1914 had relatively little impact on d'Ault du Mesnil's work in Brittany. While Le Rouzic was absent at certain times during the Great War, d'Ault – aged 71 years at the beginning of the conflict – remained active in the region and continued the restoration of some monuments (e.g. Le Ménec; Ault du Mesnil 1918: 41).

5.2. The final years (1914-1921)

Age had not diminished d'Ault du Mesnil's capacity for scientific work. The death of his daughter on 29 November 1912 however, had been a shock to both d'Ault and his wife. This event resulted in a closer relationship with his son-in-law, Raymond de Passillé (1873-1942). Since then, d'Ault du Mesnil travelled frequently with Passillé across France, also visiting Tunisia, Algeria (April 1912) and Italy (May 1914).
Information about the last four to five years of his life is scarce. Despite his advanced age it seems that d'Ault du Mesnil continued travelling to the Carnac region, working on the monuments there until 1920 (Capitan 1921: 67). On 11 March 1921 d'Ault du Mesnil died at his home in Paris.

His death however, left a series of questions surrounding his scientific activity unanswered.
First was the problem of his collections from the valley of the Somme. In 1918 the small house he had in Abbeville was destroyed in an air raid and with it an important part of his prehistoric and geological collection (v. Figure 5) disappeared. Some objects were thankfully rescued from the rubble, and following d'Ault's last will these materials were donated to the *Musée de Saint Germain en Laye* near Paris.
Secondly, many of the documents relating to d'Ault du Mesnil's work in Brittany had been stored in his apartment in Paris. Since d'Ault's death, Raymond de Passillé and Henri Breuil worked together trying to organise the papers, objects and photographs accumulated by the researcher over his career. By this point, Passillé had met Charles Bénard (1867-1931), naval commander and member of the group of researchers who, in 1921, founded the *Musée d'Archéologie de Penmarc'h* in the Finistère region. Aware of d'Ault du Mesnil's former links with members of this group (e.g. Alfred Devoir, 1865-1926), Charlotte d'Ault du Mesnil and Raymond de Passillé donated what remained of Geoffroy d'Ault's library and iconographic documents to the group in 1923 (Giot, 1993: 15). Pierre-Rolland Giot (1919-2002) inherited, compiled, studied and preserved all these files, integrating them to the *Laboratoire d'Anthropologie, Préhistoire, Protohistoire et Quaternaire armoricains* in Rennes (López-Romero and Daire 2013).
Thirdly, there is the question of the Abbeville museums that d'Ault had reorganised. In 1918 the collections of the *Musée Boucher de Perthes* at Abbeville were transferred in order to protect them from aerial bombardment in the war. During the 1930s Léon Aufrère (1889-1977) undertook a reorganization of the collections, but in May 1940 the Musée was destroyed by the bombs of another world war (Aufrère 2007: 39). Most of the prehistoric collections and original documents it contained were destroyed and the remaining objects and documents were grouped with those from the Musée de Ponthieu, also in Abbeville. On 11 July 1954 the *Musée Boucher de Perthes* was reopened in a

new building, and L. Aufrère managed to loan several objects originally deposited in Paris for the collection.

D'Ault du Mesnil's legacy persisted in the French scientific world for some time, illustrated by the establishment of a research award bearing his name. Organized on the initiative of Charlotte d'Ault du Mesnil, it was awarded every three years and was endowed with a sum of 10,000 francs (Verneau 1923: 269-270). However, records of only three award holders exist, the last of which was granted in the mid-1930s: a study of Neolithic civilizations in France (by G. Poissoin, *Prix d'Ault du Mesnil* 1927), a study on neo-eneolithic standing stones and statue-menhirs (by F.-Ch. Octobon, *Prix d'Ault du Mesnil* 1930) and a study on the Prehistory of Indochina (by E. Patte, *Prix d'Ault du Mesnil* 1935).

The last specific references to the work of Geoffroy d'Ault du Mesnil were made in the mid-1950s by H. Breuil, who had access to some unpublished manuscripts and notes for his research into the Quaternary and the Lower and Middle Palaeolithic (e.g. Breuil and Kelly 1954). Following this, references to d'Ault are extremely rare, with only a superficial understanding of his scientific work surviving.

6. Discussion

The scientific profile of Geoffroy d'Ault du Mesnil is varied and complex. Despite spending so much time working in museums (Musée d'Histoire Naturelle and Musée Archéologique in Vannes; Musée Boucher de Perthes and Musée du Ponthieu in Abbeville), d'Ault du Mesnil was an experienced field-worker. As we have seen from 1863 to 1898 he studied the geology and geomorphology of the Carnac and Locmariaquer region in connection to its monuments, he travelled the country to build up a personal mineralogical and archaeological collection, analysed the Quaternary terraces of the valley of the Somme, excavated several Palaeolithic and Neolithic sites throughout France and played a key role in overseeing scientific research at different levels.

His scientific work until c.1898 fits well into the evolutionary paradigm, which was becoming dominant from the last third of the nineteenth century and whose biggest impact on contemporary society was the idea of progress. However, in comparison with the rigid linear and typological classifications of G. de Mortillet and his closest followers, d'Ault du Mesnil emphasised the complexity of the geological and archaeological records, pointing out the longevity of certain technological features across different periods, using the stratigraphic method as the basis for the process of classification. This approach benefitted from his thorough field observations as well as the role that his interdisciplinary nature played in the process of his research. We believe that the origin of this strategy can principally be found in the early influence that the Société Polymathique du Morbihan had on him during the decade of the 1860s.
From c.1900 his research seems to adopt a rather different perspective, focussing on the study of the megalithic monuments in southern Brittany. Taking the observations made by Charles Keller (1843-1913, an engineer from Nancy settled in Carnac) on the carved motifs of monuments such as Luffang in Morbihan as a starting point (Keller 1905), d'Ault established a link between these representations and others from the eastern Mediterranean. Integrating architectural and socio-economic arguments into the discussion, this led him to propose a relationship between Brittany and Greece at the

time the monuments were constructed. The precise nature of this (diffusionist?) interpretation is difficult to determine, as is its relationship with similar theories of the time (Montelius 1899; Siret 1913: 59-64). The only source of information we have so far discovered concerning it is a very short unreferenced and undated note.

His colleague and friend Dr. Louis Capitan, one of the most pre-eminent prehistorians of the age, defines him as the father of modern methods in the study of Quaternary deposits (Capitan 1921: 66); and d'Ault indeed seems to have been an immediate precursor to the wave of innovation which occurred in the field of prehistory at the beginning of the twentieth century (Coye 2005: 705). Many questions remain open, exacerbated by the scarcity of his publications and the unfortunate destruction and dispersal of his personal collections, regarding the key role he played in the establishment and development of geological and prehistoric studies in France, Europe and beyond. Therefore, only with further research can we assess Geoffroy d'Ault du Mesnil's scientific impact in more concrete terms.

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Figure captions

Figure 1. Map of France showing the location of the main places cited in the text (base map modified after E. Gaba, Wikimedia Commons).

Figure 2. Synthesis of G. d'Ault du Mesnil's classification (1889) of the Quaternary in the region of Abbeville.

Figure 3. The Boucher de Perthes Museum (Abbeville) in 1894. Photograph G. Fourdrignier. Paper print. © Laboratoire Archéosciences UMR6566 CReAAH.

Figure 4. The Prehistory room in the Boucher de Perthes Museum (Abbeville) in 1894. Photograph G. Fourdrignier. Paper print. © Laboratoire Archéosciences UMR6566 CReAAH.

Figure 5. G. d'Ault du Mesnil's geological and paleontological collections, Abbeville, 1894. Paper print. © Laboratoire Archéosciences UMR6566 CReAAH.

Figure 6. H. Breuil (left), L. Capitan (centre) and G. d'Ault du Mesnil (centre-right, behind Capitan) on the journey to England, between Calais and Dover, on 14 September 1899. Photograph G. Fourdrignier. Paper print. © Laboratoire Archéosciences UMR6566 CReAAH.

Figure 7. Excavations in Campigny, 25 July 1897. Sitting on the profile: L. Capitan (in the foreground to the left) and G. d'Ault du Mesnil (in the foreground in the centre). In the background (with a long white beard) Ph. Salmon. Paper print. © Laboratoire Archéosciences UMR6566 CReAAH.